

NOTES ON SOME EAST-AMERICAN SPECIES
OF BROMUS.

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If one may judge from the confusion of specimens in many herbaria, the species of *Bromus* are not yet satisfactorily understood, notwithstanding the revision of Shear (Bull. U. S. Div. Agrost. no. 23, 1900) and the more recent treatments in our various manuals. Perhaps the following brief sectional keys will aid in making clear the relationship of some of the eastern species.

Following Rouy & Foucaud (Fl. France), Ascherson & Graebner (Synop. Mitteleu. Flora) and other authors, *Bromus secalinus*, *B. racemosus*, *B. commutatus*, and *B. hordaceus* may be correlated in the following manner:

- a. Lemmas firm; panicle not compact though the branches often erect; spikelets plainly pedicelled. *b.*
- b.* Lemmas at maturity spreading, each individually involute exposing the rachilla, 7–8 mm. long, all nearly equal, sheaths glabrous except the lowermost; blades pubescent or subglabrous; panicle loose, the branches generally more or less spreading; anthers 1.5–1.8 mm. long. *c.*
- c.* Lemmas glabrous.....1. *B. secalinus.*
- c.* Lemmas pubescent.....forma *hirtus.*
- b.* Lemmas at maturity ascending, not separately involute, therefore the rachilla not ordinarily exposed; lower lemmas longer than the upper; panicle contracted, the branches erect; sheaths and blades pubescent. *c.*
- c.* Lemmas 7 mm. long; anthers 2.0–2.5 mm. long; panicle contracted; branches short, in pairs, bearing 1(2) spikelets.....2. *B. racemosus.*
- c.* Lemmas 9 mm. long; anthers 1.5 mm. long; panicle more open, with long lower branches bearing several spikelets except in depauperate specimens.....3. *B. commutatus.*
- a. Lemmas thin, veiny; panicle compact; the branches very short and spikelets nearly sessile; (lemmas broader than in the last species, 7–9 mm. long; anthers 1–2 mm. long; sheaths and blades pubescent). *b.*
- b.* Spikelets pubescent.....4. *B. hordaceus.*
- b.* Spikelets glabrous or merely scabrous.....forma *leptostachys.*

1. *B. SECALINUS* L., Sp. Pl. 76 (1753).—Common in grain fields and waste places almost throughout the United States and southern Canada.

Forma **hirtus** (F. Schultz) comb. nov. *B. secalinus*, var. *velutinus* Rchb. Icon. Fl. Germ. i. t. lxxv, fig. 1599 (1834), not Schrad. *B. mutabilis* ♂ *hirtus* F. Schultz, Flora, xxxii. 235 (1849). *B. secalinus* I. vulgaris, a. *typicus*, 2. *hirtus* Aschers. & Graeb. Syn. Mitteleu. Fl. ii. 604 (1901).—One specimen seen from America, collected in an oat-

field in dry upland soil, Calapooga Valley, Douglas County, Oregon, 1899, *M. A. Barber*, no. 84. Ascherson & Graebner note that this form has been thought by some to be of hybrid origin (*B. hordaceus* × *secalinus*), but they consider the evidence insufficient.

2. *B. RACEMOSUS* L. Sp. Pl. ed. 2, 114 (1762).—Rare in America. The only American specimen seen by the writer was from a railway embankment, Grand Pré, Nova Scotia, 1901, *Howe & Lang*, no. 375. Shear cites one from Cape Breton Island, one from Foxcroft, Maine, one from Bucks County, Pennsylvania, and one from Delaware. The writer has seen a duplicate of the Maine specimen. It is probably an undeveloped plant of *B. secalinus*.

3. *B. COMMUTATUS* Schrad. Fl. Germ. 353 (1806).—Frequent through the greater portion of the United States, but especially abundant in the east.

4. *B. HORDACEUS* L. Sp. Pl. 77 (1753). *B. mollis* L. Sp. Pl. ed. 2, 112 (1762).—Frequent along the Atlantic coast from Nova Scotia to North Carolina; also in New York State, and common through the northwestern states.

Forma **leptostachys** (Pers.) comb. nov. *B. mollis* β *leptostachys* Persoon, Synop. i. 95 (1805). *B. mollis-lejostachys* (M. & K.) Fries, Sum. Veg. 76 (1846), questionably published. *B. mollis*, var. β *glabrescens* Coss. & Germ. Fl. Env. Paris, 654 (1845). *B. mollis* b) *liostachys* Aschers. Fl. Brand, i. 865 (1864). *B. hordaceus* β *leptostachys* Beck, Fl. Nieder-Oest. 109 (1890).—Scattered through the range of the typical form.

In the *ciliatus* group much confusion is due to the placing of too great emphasis on the character of the exertion or inclusion of the nodes. Though the upper nodes are almost always exerted at maturity, in *B. ciliatus* and *B. purgans* they frequently are not so in younger or depauperate specimens, and in most cases it is the uppermost node only that is so exerted. The following is a brief synopsis of *B. ciliatus* and its immediate allies:

a. Anthers 1.0–2.5 mm. long; lemmas thin, papery; lateral nerves prominent to the base. b.

b. Lemmas narrow, 2.5–3.2(3.4) mm. wide (10–13 mm. long), usually strongly ciliate between marginal nerves and margin, otherwise glabrous; glumes glabrous, nerves scabrous; upper nodes usually exerted at maturity; flanges at orifice of sheath not apparent; nodes almost always hairy; leaves with rare exceptions with scattered or dense pubescence at least above. c.

c. Lemmas strongly ciliate. d.

d. Sheaths villous; blades usually hairy..... 1. *B. ciliatus*.

d. Sheaths glabrous or the lowermost slightly villous;

blades usually glabrous.....forma *denudatus*.

c. Lemmas nearly or quite glabrous.....forma *laeviglumis*.

- b. Lemmas broader, 3.4–4.0 mm. wide (9–11 mm. long), pubescent over much of the lower part especially near the margin, the nerves stronger; glumes generally pubescent; nodes usually all included; flanges at summit of sheaths usually conspicuous; leaves glabrous or rarely with scattered hairs above. c.
- c. Sheaths and usually the blades glabrous or nearly so except commonly a pilose ring at summit; nodes glabrous.....2. *B. altissimus*.
- c. Sheaths and usually the blades villous; nodes usually pubescent.....forma *incanus*.
- a. Anthers (2.8) 3–4 mm. long; lemmas broadly elliptical, 3–4 mm. wide (8–11 mm. long), firmer and more involute when old than in the above, inconspicuously nerved except at summit; pubescence spread over most of the dorsal surface, very variable in density; upper nodes usually exerted; flanges of the sheaths not apparent. b.
- b. Lemmas hairy c.
- c. Sheaths and usually the blades villous.....3. *B. purgans*.
- c. Sheaths and usually the blades (or all but the lowest) glabrous.....forma *laevivaginus*.
- b. Lemmas nearly or quite glabrous.....forma *glabriflorus*.

1. *B. CILIATUS* L. Sp. Pl. 76 (1753). *B. canadensis* Michx. Fl. Bor. Am. i. 65 (1803). —Labrador to Pennsylvania and westward to Minnesota, British Columbia, Oregon and Nevada.

Forma **denudatus** f. nov., vaginis glabris infimis interdum exceptis. —Throughout the range of the typical form; not uncommon. TYPE in Gray Herb.; Ashfield, Massachusetts, 1909, *E. F. Williams*.

Forma **laeviglumis** (Scribn.) comb. nov., *B. ciliatus laeviglumis* Scribn. in Shear, Bull. U. S. Div. Agrost. xxiii. 32 (1900) — Occasional; reported from Maine, North Carolina and Ontario. The Gray Herbarium specimen of the Maine plant cited by Shear (*Fernald & Strong*, no. 488) is *B. altissimus* Pursh.

In Central New York *B. ciliatus* is generally an inhabitant of marl springs and calcareous boggy places. In other portions of its range it does not seem to be confined to boggy places or even to calcareous situations, yet no structural difference is apparent between the New York material and that from elsewhere.

2. *B. ALTISSIMUS* Pursh, Fl. Am. Sept. ii. 728 (1814), teste Shear. *B. ciliatus*, var. *Porteri* Rydb. Contr. U. S. Nat. Herb. iii. 192 (1895), teste Shear. *B. purgans latiglumis* Shear, Bull. U. S. Div. Agrost. xxiii. 40 (1900). *B. latiglumis* Hitchc. RHODORA viii. 211 (1906). — A plant of alluvial bottomlands and alluvial stream banks in calcareous regions: northern Maine and western Connecticut to Pennsylvania, and through New York to Iowa (Montana, Nebraska and Missouri, *Shear*).

Forma **incanus** (Shear) comb. nov. *B. purgans incanus* Shear, Bull. U. S. Div. Agrost. no. 23, 41 (1900). *B. incanus* Hitchcock, RHODORA viii. 212 (1906)—Central Maine, Vermont, western Con-

necticut, Pennsylvania, Delaware and West Virginia through New York to Ohio (South Dakota, Iowa and Texas, *Shear*).

3. *B. PURGANS* L. Sp. Pl. 76 (1753). *B. ciliatus*, var. *purgans* Gray, Man. 600 (1848).—Rocky woodlands, usually if not always in calcareous regions: New Hampshire and Eastern Massachusetts to Florida, westward to Wisconsin, Illinois and Louisiana (Wyoming, Nebraska and Texas, *Shear*).

Forma *laevivaginatus* f. nov., vaginis glabris infimis interdum exceptis.—Scattered through the range of the typical form. TYPE in Gray Herb.: damp thickets in Enfield Ravine, Ithaca, New York, 1916, *F. P. Metcalf*, no. 5821.

Forma *glabriflorus* f. nov., lemmatibus glabris.—New York: rich hillside opposite Beech Woods, Six Mile Creek, Ithaca, 1916, *F. P. Metcalf*, no. 5813 (TYPE in Gray Herb.).

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REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXXV.

UMBELLIFERAE.

AEGOPODIUM.

A. PODOGRARIA L. Persisting in waste places, rare; Ipswich, Topsfield, Danvers, Cambridge, Watertown, Brookline, Milton.

AETHUSA.

A. CYNAPIUM L. Waste places; frequent near Boston, few reports elsewhere in the district.

ANGELICA.

A. atropurpurea L. Meadows and grassy swamps; frequent north and west of Boston; in south only at Hingham (*T. T. Bouvé*) and Marshfield.

ANTHRISCUS.

A. SYLVESTRIS (L.) Hoffm. On site of old building, Stony Brook Reservation, Suffolk Co. (*N. T. Kidder*, July 17, 1919).

BUPLEURUM.

B. ROTUNDIFOLIUM L. Gravel sidewalk, not persisting, Cambridge (*W. Deane*, June 15, 1884).

CARUM.

C. CARVI L. Moist grassy places, occasional throughout, but much more abundant northward.